January 10, 2000

Members and Alternates,
California Traffic Control
Devices Committee:

Attached for your use, is a second copy of the November 19, 1999 minutes with segregated agenda items. Items to be included in the agenda for the next regular meeting on March 15, 2000 should be **submitted no later than January 14, 2000.** Please make submittals in a timely manner.

Sincerely,

Jack M. Kletzman
Executive
Secretary, CTCDC

Enclosure

SEGREGATED MINUTES

CALIFORNIA TRAFFIC CONTROL DEVICES COMMITTEE
MEETING OF
November 19, 1999

MINUTES

Amendments to the July 22, 1999 minutes.
Page 5, Item 99-1, Norm Sucher's name should be Suker.
Page 8, Item 99-3, last paragraph, Dick Wallo should be Dick Folkers.
Page 2, John Fisher is from the City of Los Angeles.
Page 4, the MOTION should be "left-turn yield sign as an alternate to the current R-73."

MOTION: By Dick Folkers, second by Jim Larsen, to adopt the minutes as amended, of the San Diego meeting, held on July 22, 1999. Motion carried 8-0.

MEMBERSHIP

Mr. John Wallo and Mr. Jack Kletzman were given recognition for their long service on The Committee. John Wallo has retired. Jack Kletzman will retire early next year.

Mr. Jim Larsen has replaced John Wallo as the Southern California CSAC representative. Mr. John Squier is the new alternate member representing CSAC.

Mr. Farhad Mansourian has been elevated to be the Northern California CSAC representative and Mr. John Presleigh replaces him as the alternate member representing CSAC.

Sgt. Sandy Champion represented Capt. Stan Parez for the CHP.

ELECTION OF OFFICERS

MOTION: By Wayne Tanda, second by Dick Folkers, to retain Ray Mellen, the current Chairman. Motion carried 8-0.
MOTION: By Merry Banks, second by Farhad Mansourian, to elect Jim Larsen as Vice Chairman. Motion carried 8-0.

ADJOURNMENT

MOTION: By Merry Banks, second by Wayne Tanda for adjournment.
Motion carried 7-0. The meeting was adjourned at 3:20 p.m.

PUBLIC COMMENTS

None.

CTCDC MINUTES
November 19, 1999

90-7 BICYCLE SIGNAL HEADS

[In order to make the minutes more understandable, I am attaching the proposed draft in its final recommended form.]

Wayne Tanda credited Dave Pelz, who has recently retired, as the driving force behind this project. Tanda told the Committee that the device was unique in the United States, and required a change in legislation in order to be adopted. The legislation requires usage according to Caltrans' warrants.

Rick Blunden told the Committee that the proposed draft warrants had been through a lengthy review process by the California Bike Advisory Council (CBAC), and Caltrans Districts. Gerry Meis pointed out that the agenda had both the new version and the original draft handed out by him in San Diego, marked "superseded", for comparison. Meis said he would lean heavily on the advice of local jurisdictions. He wants to have approved warrants established by January 1st, when the law takes effect. Dick Folkers wanted to make sure the warrants were acceptable to Caltrans.

Wayne Tanda suggested that both the vehicle and bicycle have the same peak hour to reflect the degree of conflict. Rick Blunden responded that at the main test intersection, where these bicycle traffic lights have been tested, there is a large bicycle peak in the morning and the peak vehicle traffic is both in the morning and late afternoon. The intent of the draft is that the peaks be independent. Blunden noted that since CBAC had reduced the original draft volumes he felt that they would not be opposed to having the peak volumes at the same time. Dave Peltz concurred.

Wayne Tanda also suggested that the verbiage be changed from "a 'Traffic Engineer' make the determination that a bicycle signal head would reduce the number of collisions", to "a responsible public official". Many local jurisdictions do not have a Traffic Engineer. Gerry Meis suggested "the agency of jurisdiction". Dick Folkers supported using "a responsible individual" to replace "Traffic Engineer" and preferred this to "agency". Tanda pointed out that the Director of Public Works might be making the determination rather than an elected body. Ray Mellen noted that there were fewer agencies having someone designated as the Traffic Engineer. The individual having traffic engineering responsibilities may have a different title.

90-7 BICYCLE SIGNAL HEADS (continued.)

Rick Blunden told the Committee that responses to the draft indicated there was some confusion concerning the definition of vehicle and bicycle volumes. Blunden suggested that the volumes be defined at the peak hour, traveling through the intersection, since the intent was to measure the total number of conflicts in the intersection. Jim Larsen concurred with a need to clarify the definition of peak volume. Ray Mellen suggested using "entering the intersection" because it is the standard terminology.

John Wallo recommended breaking the geometric condition into two parts. Putting a period after. "Where a separate bicycle/multi-use path intersects a roadway" and, as a separate condition, "At other locations to facilitate a bicycle movement that is not permitted for a motor vehicle." Rick Blunden concurred.

Farhad Mansourian established that, in order to qualify for a bicycle signal head, either the Volume and Collision or the Volume and Geometric warrants had to be met. John Fisher expressed concern about satisfying two conditions simultaneously. Fisher felt that special phasing should be independent of the volume of bicycles. He feels that, if there were 500 vehicles per hour and a special bicycle facility with 25 bicycles per hour, these conditions should warrant a bicycle signal head. Gerry Meis thought that local jurisdictions would be put in an awkward position if a less than significant bicycle volume demanded the bicycle signal head. Fisher acknowledged that if there were a Class II facility, bicyclists can use a green ball. But once the facility has been designed to accommodate an exclusive bike path, or there is a need to provide a bicycle phase because of unusual geometrics, it should be independent of volume. A conflict exists whether there are ten or fifty bicycles.

Dick Folkers said that normally when such a facility is constructed, there will be high volumes of traffic. Wayne Tanda thought that, without the proposed volumes, some alternate device would suffice. Tanda feels the bicycle signal head should be reserved for use with substantial demand. Meis advised the Committee that, if the proposed warrants were too stringent, the Committee could reopen this topic at a future date.

90-7 BICYCLE SIGNAL HEADS (continued.)

John Fisher would like to use the bicycle signal head to regulate proposed bicycle paths, along the Los Angeles River, which will cross an arterial street at mid block. Jim Larsen noted there were bicycle paths in Santa Barbara County which intersect with public roadways and are controlled by STOP signs on the bicycle paths. Larsen sees other solutions for low volume conditions. Ray Mellen recalled that STOP signs were also used, under similar conditions, in Irvine. Fisher did not want to use standard signals because of pedestrians.

Rick Blunden suggested that in most cases, where there is no signal, a STOP sign on the bicycle path has been sufficient. CBAC and Caltrans addressed this issue, and in the next update of the Highway Design Manual there will be some recommended practices for handling mid-block crossings. Sometimes a STOP sign is not sufficient. The bicycle advocacy community, as well as a number of Traffic Engineers, are concerned about the misuse of the bicycle signal head in locations where the device may not be appropriate. That is why the proposed warrants contain the statement that bicycle signal heads should only be considered after other alternatives have been given an adequate trial. Blunden understands the problems that can develop from having a mid-block crossing of a wide arterial with high traffic volumes. He agrees with others that Volume and Collision, or Volume and Geometrics, is a good compromise for the 5 year duration of the law. If the warrants, in the proposed form, are not adequate the issue can be revisited. Considering the process these warrants have been through, Blunden feels more comfortable recommending the combined warrant.

Doug Maas established that the warrants require that bicycle signal heads can only be used in combination with a standard signal head. If there is no traffic signal they cannot be used. Jim Larsen, responding to the City of Los Angeles' intended use of bicycle signal heads to discourage pedestrians, noted that bike paths are also be used by roller bladers and joggers/pedestrians. Dick Folkers recalled that Sacramento had a bike path that used standard signal heads for pedestrians, bikes, and main street traffic. Pedestrians had buttons to operate the pedestrians signal, there were loop detectors for bicycles, and main street traffic had a standard signal. Folkers envisioned the warrants to mean standard signals for street traffic and bicycle head signals for the bike path.

90-7 BICYCLE SIGNAL HEADS (continued.)

Rick Blunden responded that the intent of the warrants is not to provide an opportunity for the installation of bicycle signal heads to direct bicycle traffic where a standard traffic signal is appropriate. If there are conflicts, significant traffic volumes, and other measures have not worked, then a bicycle signal head may be used, if it is thought that a separate phase will make a difference.

A motion was made that the term "Traffic Engineer" be replaced with "responsible party of the agency ". Farhad Mansourian was concerned that a County could have more than one responsible party, from different departments. He suggested using "Public Works Director" or "City Engineer". Wayne Tanda cautioned against using "City Engineer" because of the variety of types of jurisdictions and suggested "responsible public works official".

MOTION: By Wayne Tanda, second by Farhad Mansourian, to recommend adoption of the warrants with the following amendments. That the bicycle and vehicle traffic volumes be noted as that "volume entering the intersection", that the peak hours for bicycle and vehicle traffic be the same, that the term "Traffic Engineer" be replaced with "responsible public works official" and that the final sentence be broken into (a) Where a separate bicycle/multi-use path intersects a roadway or (b) At other locations to facilitate a bicycle movement that is not permitted for a motor vehicle. Motion carried 8-0.

ACTION: Item completed.

CTCDC MINUTES
November 19, 1999

BICYCLE SIGNAL STANDARDS
RECOMMENDED BY THE CTCDC 11/19/99

A bicycle signal is an electrically powered traffic control device. It may be used only in combination with a traffic signal. It directs a bicyclist to take specific actions and may be used to improve an identified safety or operational problem involving bicycles.

Since a separate signal phase for bicycle movement will reduce the green time available for other phases, alternate means of handling conflicts between bicycles and motor vehicles should be considered first. The most likely alternatives are:

1. Striping to direct a bicyclist to a lane adjacent to a traffic lane such as a bike lane to the left of a right-turn-only lane.

2. Redesigning the intersection to direct a bicyclist from an off-street path to a bicycle lane at a point removed from the signalized intersection.

A bicycle signal phase should be considered only after these and other less restrictive remedies have had an adequate trial with enforcement and with the result that the collision frequency has not been reduced.

WARRANTS - A bicycle signal may be considered for use only when the volume and collision or volume and geometric warrants have been met:

1. VOLUME - When $W = B \times V$ and $W > 50{,}000$ and $B > 50$
   Where W is the volume warrant.
   B is the number of bicycles at the peak hour entering the intersection.
   V is the number of vehicles at the peak hour entering the intersection.
   B and V shall use the same peak hour.

2. COLLISION - When 2 or more bicycle/vehicle collisions have occurred over a 12-month period and the responsible public works official determines that a bicycle signal will reduce the number of collisions.

3. GEOMETRIC - (a) Where a separate bicycle/multi-use path intersects a roadway or
   (b) At other locations to facilitate a bicycle movement that is not permitted for a motor vehicle.

94-10 PEDESTRIAN SIGNAL HEAD

Doug Maas recalled that at the last meeting he explained that the County did not have the resources to pursue further studies. Other studies were in progress, including two FHWA studies. Maas said he did not have the any new information at this time. The Virginia study is expected in December of this year. The City of Monterey finished their study, but the status of MUTCD acceptance is unknown. The Minnesota DOT study has just been completed, in draft but there are no analysis or recommendations yet. He wanted to express that the Chief of his division was strongly in favor of the device and would like to use the device as soon as possible. There is a new manufacturer available. Manufacturers have told him that there was demand for the device. Maas hoped to have data for the Committee as the reports become available.

Mansour Malek told the Committee that he attended an ITE meeting in San Jose where Rich Deal of the City of Monterey passed out a safety and behavior report on the motorists perceptions of count down signal heads. He gave copies of the report and a half page of his notes to the Committee. There are two installations in the City of Monterey but only one was discussed at the ITE meeting. This site, at Del Monte Avenue, is adjacent to a recreational trail. The roadway is over 124 feet wide with seven lanes and a median island. There have been no noticeable changes in driver behavior which was defined as no acceleration by motorists as the count down goes to zero, and no complaints. The timer is set to zero at the end of the green phase which allows additional time for the pedestrian to leave the crosswalk during the yellow phase. The count down device appears to give pedestrians more confidence when crossing the intersection. Almost all pedestrians understood the meaning of the count down.

Marie Girardot expressed her support for the device. She noted that there was increased demand for production of the device across the United States. Girardot described the device as intuitive, eliminating confusion and providing greater confidence to those who are physically challenged. Matt Schmitz agreed to find out how many experiments are being sponsored by FHWA and whether there is any proposed rule making in progress. Doug Maas noted that Hampton, Virginia and the City of Monterey have requests for experimentation from FHWA. Wayne Tanda expressed the hope that an action could be taken at the next meeting and recommended that the outstanding issues be addressed with information from the other current experiments. Ray Mellen suggested coordination with the FHWA.

ACTION: Item continued.

CTCDC MINUTES
November 19, 1999

99-1 GAPS FOR PEDESTRIAN CROSSINGS

Gerry Meis said he had not been able to discuss this item with Norm Suker. Meis had discussed the matter with the Electrical Systems Branch of Caltrans and they not believe there is a significant problem.

Ray Mellen explained that Norm Suker, who brought this matter to the Committee's attention, is a consultant with a fair amount of expert witness experience and is quite concerned about the discrepancies.

Gerry Meis noted that the Traffic Manual does not specifically require that the width of the roadway be taken into consideration. Meis believes most engineers using the Caltrans Traffic Manual are intelligent enough to know to take the road width into consideration. The Caltrans Traffic Manual does not tell an engineer everything he must consider in designing a roadway feature. Ray Mellen requested that in addition to working within Caltrans, that Meis contact the consultant and keep him informed.

ACTION: Item continued.

CTCDC MINUTES
November 19, 1999

99-3 AUDIBLE PEDESTRIAN SIGNAL POLICY

Ray Mellen recalled from the last meeting that the two parties representing the visually impaired were to meet, come to some agreement, and then bring that agreement back to the Committee.

Gene Lozano said that the meeting of the California Council for the Blind (CCB) and the California Association of Orientation and Mobility Specialists (CAOMS) did not take place. Lozano said that a Dr. Sandra Rosen from, from San Francisco State University, told him that the Northern and Southern chapters became one entity and have not been contacted on this issue.

John Fisher identified himself as a member of the Signals Technical Committee of the National Committee on Uniform Traffic Controls Devices. He explained that there was a divergence of opinion about the issue which makes it difficult for the CTCDC to resolve the various professional opinions. Fisher passed out a draft of what is about to be approved in the MUTCD. Referring to the text, he said that the title is “Accessible Pedestrian Signals” as opposed to “audible” or “tactile” pedestrian signals. That specific terminology is used because there are a family of devices which could meet the needs of the visually impaired. Accessible pedestrian signals are defined as signals which provide information in non-visual format including audible tones, verbal messages, and or vibrotactile information. Fisher noted there are cases where an audible sound could be provided, but because of the complexity of the intersection, the identification of the crosswalk might be ambiguous.

John Fisher said that the range of devices, the state of art of the technology, and concerns of the blind community have been heard, discussed, and resulted in this draft National Committee proposal. Fisher said that the CCB expressed concern that the blind community be able to find these devices when they approach the intersection and is why they have a preference for audible pedestrian devices. If you can hear an audible device you can locate the push button. There is an alternative device known as a locater. The new proposal uses “should” instead of “shall” for audible location of pushbuttons. Fisher asked that the Committee be consistent with the language in the national manual.

99-3 AUDIBLE PEDESTRIAN SIGNAL POLICY (continued.)

Dick Folkers established that the national manual has not yet been printed and this draft had only been approved at the committee level. Gene Lozano said that California has had official guidelines for the existing signals since 1996. The national level has no such guidelines and the draft is a major step forward. Lozano talked to Dr. Benson, a researcher on this project, who said there was a considerable amount of unknown information and research that needs to be done. They are still trying to determine what sound should be used to locate the push button. The CCB is definitely in support of a locator system. Even with a standard location, different types of poles make a locator system desirable. Dr. Benson also said that in addition to the vibrotactile device, there needs to be an audible sound to identify the WALK phase. There has to be research on whether the stanard is a talking sound, and in ethnic communities, whether the sound should be in a foreign language. The visually impaired community is split on these issues. In California we have the coo-coo/peep-peep standard which most people accept. When there is a problem it is usually caused by poor installation of the devices. Nationally there is some guidance as to the distance between devices. Push buttons with audible sound, or overhead devices, should be ten foot minimum. Lozano believes some locations work better than others because of the placement of the devices. The placement of audible devices needs a lot of research.

Gene Lozano said Resolution 98B-16 proposed a moratorium on existing standards until more research and the national guidelines are available, and sets up a multidisciplinary task force to propose new standards. Lozano said these devices also help people in wheel chairs, when they cannot see the light from the angle they are sitting, and some mentally retarded people, who cannot be trained to understand the meaning of the traffic signal colored lights.

Gene Lozano requested, on behalf of the CCB, for the Committee to encourage research, but take no action until sufficient data is available, and then to form a taskforce. Existing guidelines do not preclude manufacturers from selling their products because they all make devices with the coo-coo/peep-peep standard. Uniformity is of utmost importance. If the existing standard is going to be changed, it has to be changed on the basis of scientific research.

99-3 AUDIBLE PEDESTRIAN SIGNAL POLICY (continued.)

Bobby Sulivan told the Committee that her work takes her to unfamiliar areas and that she appreciates encountering an audible signal. Sulivan supports uniformity and recommends that, in order to avoid causing confusion to the user, the Committee not act in haste.

John McGaffey said that inclusion of vibrotactile devices in the MUTCD as a national standard merely allows engineers the choice of vibrotactile devices and/or audible signals at intersections. It has also standardized the repetition rate for a locating tone. Accessible signals should have a locating tone for identification. He concurred that a proposed standard tone is a future project. There are also no standardized tone for the walk cycle. McGaffey said his product can emit any recordable sound. They use as a standard the coo-coo/peep-peep sound. He is unsure that the coo-coo/peep-peep is a standard, because he was unable to get a printed copy of the specification denoting the frequency of the coo-coo/peep-peep sound. He feels this issue is still in a state of flux.

John McGaffey told the Committee that, according to users, the coo-coo/peep-peep sound is a problem in the East, where cities have intersections which are not in a North-South / East-West direction. The sound is a problem is intersections that have more than four entries. McGaffey saw an extremely complex intersection in Oakland, having six entries with poor installation of audible devices. With so many sounds and directions it is extremely difficult for a visually impaired person to know, with any kind of certainty, that it is their turn to go. The benefit of combining the vibrotactile and audible is that it gives 100% assurance based on the WALK indication.

John McGaffey said that, based on the systems that he sells, the voice is most preferred. The cities are buying a completely quiet version, which is used in neighborhoods where people are familiar with the intersection and only need to know when to walk. In downtown areas, where people are unfamiliar with the environment, they need a locator tone. Such a device can tell them the intersection location, the street they are crossing, and it can say “Walk sign on to cross Grand.” The voice message is what most people want because it eliminates confusion. These are the directions he is hoping to find in the DOT document which proposes voice as an option.

99-3 AUDIBLE PEDESTRIAN SIGNAL POLICY (continued.)

Frank Girardot recalled that he came to the Committee twenty years ago to introduce the audible pedestrian signal for the visually impaired. Three years were spent determining if it was a traffic control device. Having established that it was a traffic control device, Caltrans established a standard with the frequency and the sound output of the audible signal. Girardot urged the Committee not to destroy the existing standard.

Dick Folkers cited limited research funds, length of time for implementation, and length of time to update standards as reasons to stay with the existing standard. There is a value associated with an existing standard. He urged caution in changing any standard because of the number of existing installations, yet he feels the Committee should not ignore advancing technology.

Wayne Tanda brought the Committee's attention to the fact that there are two separate and distinct items on this agenda. Item 99-3 is to consider three resolutions brought to the Committee adopted by the CCB on November 8, 1998. The three resolutions were to support existing State guidelines for accessible facilities, to install audible signals at all intersections, and to not change any of the guidelines without a comprehensive study. The City of Los Angeles has asked to adopt a tactile device or to let them test the device. Tanda sees these two issues as compatible. Testing for a comprehensive plan is in accordance with the CCB resolution.

Gerry Meis said that because of budgetary constraints, intersections cannot be outfitted with all the gadgetry available. Meis feels the CCB would prefer to have audible devices, if only one device were installed. Gene Lozano confirmed that the CCB feared that tactile devices might be substituted for audible devices.

Wayne Tanda said he supported CCB's resolution to maintain existing guidelines but took exception, because of budgetary considerations and other issues, to install audible signals at all intersections. Tanda feels this should be a "may" condition, subject to a comprehensive plan. He feels the last resolution, the gathering of information, is entirely appropriate. He would not support changing any permanent guideline without supporting data. Tanda suggested that the City of Los Angeles include and reflect, in its evaluation, the concerns of the CCB.

99-3 AUDIBLE PEDESTRIAN SIGNAL POLICY (continued.)

Gene Lozano told the Committee there were two CCB resolutions. The first resolution urges maintaining existing standards, allowing for independent research including the CCB, the CAOMS and other groups, to develop any new standards. Lozano told the Committee, the second resolution asked that when a jurisdiction decides to install audible devices at an intersection, all the permissible pedestrian crossings be equipped with those devices. This resolution did not require all intersections be installed with audible devices.

Jim Larsen suggested that the Committee wait and see what is adopted by the MUTCD before changing standards, but not preclude any experimentation. Dick Folkers established that when there were only three of the four legs of a signalized intersection available for pedestrian crossings, the resolution calls for all three of the legs to be equipped with audible signals. Gerry Meis noted that the Traffic Manual does not now require all crosswalks, where pedestrians are allowed to cross, to be installed with an audible device, if any crosswalk has such a device.

Gene Lozano agreed, noting that it would also indicate to the visually impaired that, when there is no audible sound, they are not to cross. John Fisher felt that an intersection, where one or more crosswalk locations were blocked, would be a good site to use tactile devices in place of audible devices. He cited confusion about the source of the sound.

Gene Lozano clarified that the CCB resolution does not call for the installation of audible or tactile signals at all intersections. At those intersections, where a jurisdiction decides to install such devices, the devices should be installed at all permissible pedestrian crossings.

There was some question of terminology. CCB Resolution 98B-7 refers to Accessible Pedestrian Traffic Signals. This is a generic term which includes both audible and tactile devices. The Committee chose to interpret agenda Item 99-3 as referring to audible devices and leave the decision of tactile pedestrian devices to Item 99-10.

99-3 AUDIBLE PEDESTRIAN SIGNAL POLICY (continued.)

Wayne Tanda said that the City of San Jose has the practice that if they install an audible device at on leg of an intersection, they install them at all legs where pedestrians are permitted to cross. Gerry Meis did not know what the Caltrans practice was. Gene Lozano said that the City of Sacramento will equip every leg of the intersection if there is pressure to do so. The County of Sacramento will only install devices if they can install every leg to avoid litigation. Ray Mellen suggested that the Committee not worry about changing standards, but focus on whether the resolution is a reasonable thing to support. Farhad Mansourian pointed out that there was no requirement to equip an intersection with audible devices, only that if any leg were equipped with an audible device, all the allowable crosswalks must be similarly equipped.

MOTION: By Wayne Tanda, second by Jim Larsen, to endorse the CCB Resolution 98B-7 which calls for the installation of a pedestrian audible signal on each corner, at which pedestrian crossings are permitted, at any intersection which has an audible signal. Motion carried 6-0 with 1 abstention.

Wayne Tanda said he has a concern with prioritizing the placement of audible pedestrian signals at existing locations because that implies all intersections will be equipped with audible signals. Farhad Mansourian thought equipping intersections with audible devices should be based on need. Ray Mellen thought a prioritized list for all existing locations would be a budgetary nightmare. Dick Folkers concurred. Tanda suggested that a prioritized list could be made for intersections which were warranted by a demonstrated need.

MOTION: By Wayne Tanda, second by Dick Folkers, to endorse the first and third parts of CCB Resolution 98B-16 which calls for reaffirmation of existing State guidelines and that extensive research be done on technology, prior to changing State standards to insure equivalent safety and access at signalized crossings. The second part is endorsed, with the amendment, to have a process for prioritizing the placement of audible pedestrian signals at warranted locations.
Motion carried 6-0 with 1 abstention

ACTION: Item completed.

CTCDC MINUTES
November 19, 1999

99-8 MUTCD EXPERIMENTAL PROCESS

Gerry Meis passed out a flow chart of the FHWA experimental process to the Committee. Meis said he is uncomfortable with the Committee authorizing experiments when FHWA is in no way involved. FHWA has a formal process. He cited the bicycle signal head as an example. State law calls for a response, but FHWA has never addressed such a device. Meis would like the Committee, when it authorizes an experiment for a new traffic control device, to encourage the applicant to work with the FHWA and go through their process at the same time.

Matt Schmitz said that he would expedite communications to Washington D.C. but that California really stands out as not in compliance with MUTCD Section 1 A-6 *(Manual Changes, Interpretations and Authority to Experiment.)* Schmitz wanted the Committee to know that local agencies sometimes go through the FHWA process and sometimes they do not. Schmitz said he wasn't sure whether the Committee gave any credence to the FHWA experimental process requirements, but was changing his opinion. He feels there is a lot of room for improvement. Gerry Meis said he wasn't asking the Committee to take any action but he wanted the Committee to be aware of the Federal process. While acknowledging that it is both difficult and cumbersome to accomplish, Meis feels traffic control devices should be uniform nationwide.

Dick Folkers suggested that when an experiment is submitted to the Committee, that it also go to the FHWA, but that the experiment not be delayed. Ray Mellen expressed concern about delays occurring because of Federal participation. Gerry Meis said he wasn't necessarily wanting the Committee to wait until the FHWA acted. Meis wants to conform to the MUTCD where ever reasonably possible. He reiterated his request to have the Committee require an applicant to simultaneously submit any experimental package to the FHWA. If the FHWA doesn't act on the experimental proposal, the Committee can deal with the problem at that time.

Jack Kletzman told the Committee it was always the intention to keep FHWA informed by sending them copies of agendas and minutes. Previous FHWA representatives had attended CTCDC meetings.

99-8 MUTCD EXPERIMENTAL PROCESS (continued.)

Matt Schmitz told the Committee that he did not have the authority to approve requests for experimentation. He wanted to ensure that the Committee didn't lead a local agency into believing that they had complied with all the requirements. Some local agencies are aware of FHWA requirements and some are either not aware or don't feel the need.

Jim Larsen hoped that if applicants are going to make dual submittals, that the two agencies procedures are similar enough so that the applicant is not faced with making two different submittals. Gerry Meis said that the two processes were virtually identical. Dick Folkers pointed out to the Committee, that the Experimental Guidelines revised July 17, 1997, says that, "Where Federal Standards exist, experimentation is governed by Federal experimentation procedures." and perhaps the Committee has been somewhat remiss in coordinating better with FHWA.

Matt Schmitz concurred, estimating a low percentage of compliance. Folkers concluded that this would not be a parallel process, but a linear process, which would take an inordinately long time. Meis responded that the verbiage in the Experimental Guidelines could be changed and felt that the processes were still similar.

Dick Folkers recalled his experience, a few years ago, of going through the Federal evaluation process, as slow and tedious. If government is not responsive to public interest, individuals may experiment on their own. Ray Mellen expressed concern about the process delaying or discouraging reasonable experimentation. Mellen could support the proposal if there were the expectation of a reasonable time frame.

Matt Schmitz observed that there is a perception that no one knows why the Federal process hasn't been considered. He suggested the Committee support the proposal, and if the Committee later determines that the Federal process is inhibiting experimentation, at least the process had been considered. The Committee will have gone on record as having considered the process. Schmitz thinks the turn around time may not be as long as is feared and he will get data to substantiate this position.

99-8 MUTCD EXPERIMENTAL PROCESS (continued.)

Wayne Tanda said that he has been involved with the Committee for a long time and had never been aware that there was a Federal experimentation process. Tanda recalled the Committee's experimental efforts with LEDs, crosswalk pavement lights, and other technological devices, and believes that technology will accelerate. The Traffic Engineering profession needs to keep current and cannot talk in terms of years for experimentation. Either the Federal process or the State process would be fine. Tanda does not think there should be a duplicate process. That is just a lot of bureaucracy which may result in different directions. In California there should be one process based on quality of work and timeliness. California may be criticized but a lot of the ideas that started here spread to other states.

Matt Schmitz argued that that is one of the benefits of the Federal process is that the successes and the failures make their way across the country. It is easier to share information to other States from the Federal level, than if something is developed in one State. If the Committee continues to use its own experimental process then the State has to evaluate the experimental results. If the Committee elects to use only the Federal process then there isn't that same input.

Gerry Meis pointed out that the Committee could not adopt the Federal process because of State Statutes. State law requires the Department, after consulting local agencies and the public, to set standards and specifications for official traffic control devices. Unless the State law is changed Meis doesn't see any change in the process.

Farhad Mansourian asked what commitment could the Committee get from FHWA, with respect to timeliness, if applicants are encouraged to use the Federal process. Mansourian is concerned that the process could take months and the applicants become confused and discouraged with the process.

Ray Mellen asked Gerry Meis and Matt Schmitz to get together and see if some of the FHWA's and the Committee's concerns can be addressed. Particularly if some commitment can be made to permit a reasonable time frame for experimentation.

99-8 MUTCD EXPERIMENTAL PROCESS (continued.)

Dick Folkers told the Committee that the National Committee is going to be meeting at the Sheraton Hotel on January 5-7, 2000 in Arlington, Virginia. On January 6th the research committee will be meeting. Folkers encouraged people to go to that meeting to see what is involved. It's a very sophisticated system and the time lines shown on the diagram distributed by Meis appear optimistic.

Bonnie Wells said she was involve in a project using Federal funding. It involves several States trying to avoid duplication of effort. They are going through a parallel process where there is no requirement that one process finish before the other. She feels the need to have comments from both processes to avoid problems in the future. This approach protects against any agency coming back and questioning Federal agreement. Wells did not have much change in the submittals for both processes.

Ray Mellen responded that it was not the Committee's intent to discourage anyone from going through both the State and Federal processes. The frustration is that it may be possible to go through the State process and still have several years before completing the Federal process. The experimenter will be precluded from doing anything. This would discourage experimenters from initiating the process.

ACTION: Item continued.

CTCDC MINUTES
November 19, 1999

99-9 LED ENHANCED PAVEMENT MARKERS

Dick Folkers told the Committee that the Cities of Escalon and Ripon are provided services by Caltrans, Stockton and will be installing devices on Caltrans right-of –way. Since it is on Caltrans right-of–way, Folkers surmised it would be to Caltrans specifications and Committee action may not be needed. Gerry Meis cautioned that sometimes Caltrans Districts are not in compliance with State standards and specifications. Folkers said the Cities were putting in mid-block crosswalks using these devices. Ray Mellen recalled that the Committee had authorized the City of Orange to come before the Committee with a formal proposal for experimentation. Caltrans was to review whether the device was considered a pavement marker, or a new device.

Gerry Meis passed out two drafts being proposed for the MUTCD which have not been through the formal FHWA rule making process. The first considers internally illuminated raised pavement markers used in a longitudinal pattern and the second considers a transverse pattern. Meis believes that if an internally illuminated raised pavement marker is used for longitudinal delineation, in a steady burn configuration, in the same manner as a reflective raised pavement marker it is not a new device. It is just a different source of illumination. If the device flashes or is a different color it is a new device.

Wayne Tanda understood the device flashes, but at such a fast rate, that makes it appear constant. Tanda could not recall the color of the device but the LEDs came on when it was dark. Ray Mellen recalled that the device was reflective in an appropriate color, but the LED may not be. Mellen wondered if there were a flash rate which defined steady burn. He noted that some steady burns may flash sufficiently fast so the human eye cannot distinguish a difference, yet may not technically be a steady burn. At the San Diego meeting, the device was clearly flashing. Gerry Meis said he did not have a definition for steady burn but feels what is intended is a flash rate that the human eye cannot discern. Matt Schmitz said that a flame is a steady burn, while light with frequency gives a pulsing sensation. Schmitz feels that if a light is not pulsating to the human eye, it should be considered a steady burn.

Janna McKhann said the manufacturer had provided a device which flashed at 27 Hz which, on the road, looked steady to the naked eye, but with some flashing. The manufacturer has since increased the flash rate to 50 Hz which appears as a steady burn.

99-9 LED ENHANCED PAVEMENT MARKERS (continued.)

Hamid Bahadori told the Committee he feels there is nothing new about these devices. A raised pavement marker can have a reflector or be internally illuminated as long as the level of luminosity is not so high as to distract, or blind the driver. The internal illumination makes the device more visible to the driver. The same color and longitudinal usage does not constitute a new use. Although one was not available at the meeting, Bahadori suggested giving the Committee an upgraded device for examination. He said that 50 Hz is similar to fluorescent lighting.

Hamid Bahadori declared he was willing to go either way. If the Committee decides the device is standard, then the City will install them. If the Committee feels an experiment is necessary, then Bahadori has an experiment proposal ready to submit to the Committee. Farhad Mansourian thought that either it's a standard device and the City doesn't need to appear before the Committee, or it is a new device and an experimental proposal in needed. Bahador reiterated his opinion that the device was not new, citing legal advice and supporting letters. Ray Mellen recalled that at the last meeting, the Committee was trying to expedite the process by not taking an action, and then having to tell the City that Caltrans doesn't agree and now the City needs to present an experimental proposal.

Wayne Tanda sees the issues as whether the device is a raised pavement marker with a steady burn, and whether the transverse use of raised pavement markers has been authorized. He feels that Meis agreed it was a raised pavement marker and the steady burn is an opinion based on human factors. Tanda wanted to know if raised pavement markers are an authorized device to delineate crosswalks. Gerry Meis said although they are being used in this fashion, raised pavement markers have not been approved for such use in California. Tanda suggested legitimizing this use. It could be done by the experiment or by Committee action.

99-9 LED ENHANCED PAVEMENT MARKERS (continued.)

Hamid Bahadori said that the primary purpose of the test was to demonstrate the advantage of using a brighter raised pavement marker. The proposed experiment included longitudinal and transverse illuminated pavement markers with steady burn. Wayne Tanda said that the 27 Hz raised pavement marker was not considered a steady burn but it was likely that the 50 Hz version would be. Tanda suggested that if the 50Hz version were used, no experiment would be needed, but a transverse use would require an experiment.

Hamid Bahadori observed that the longitudinal use of raised pavement markers will mark cross walks anyway. Given a four lane arterial with a median, if raised pavement markers were put on the median and the curb line, that produces seven raised pavement markers at the crosswalk.

Gerry Meis reiterated his position that if the device is a longitudinal marker, having a standard color, with a steady burn, then it is not a new traffic control device. Meis said the 27 Hz device, in his opinion, flickers. Hamid Bahadori said the 50 Hz would constitute a steady burn. Ray Mellen said that although the Committee doesn't have the technical ability to define "steady burn", most people would think 50 Hz would be a steady burn. Mellen feels that 27 Hz is probably not a steady burn, although it may appear as such to some drivers. He would discourage the use of a 27 Hz device.

Jim Larsen suggested that the Committee not be involved in whether a 50 Hz device is adequate or not nor should the Committee request experimentation data on transverse raised pavement markers. Transverse raised pavement markers are all over the State and should either be grandfathered in or ignored.

Mike Harrison told the Committee he supports the use of raised illuminated pavement markers for lane delineation. They are visible in daylight or at night and in all types of weather conditions. His only concern is that this experiment should not interfere with the current experiment on crosswalk warning lights. If the lights are continuously flashing and no one is using the crosswalk, it would send a conflicting message to the motorist. He asked the Committee to consider any impact this proposed experiment may have on the current experiment. Gerry Meis concurred.

99-9 LED ENHANCED PAVEMENT MARKERS (continued.)

Wayne Tanda said the current proposal would not affect ongoing experimentation because the device should not flicker. If it does flicker, then the whole proposal must be re-examined. Hamid Bahadori said that since the Committee agrees that 50 Hz is a steady burn, it is therefore a raised pavement marker and such markers are used all over the State to mark crosswalks. It is not the City's intent to experiment with accepted devices. The only purpose of making a proposal would be in case the Committee held that the device is a new traffic control. Wayne Tanda suggested withdrawing the request for experimentation and replacing it with a new Item considering the use of raised pavement markers for transverse delineation. Jim Larsen concurred noting that the discussion would not be related to the City of Orange. Tanda noted that this action assumes the device is a standard color, a steady burn, and standard geometrics. This use is supported by the proposed rules of the FHWA.

Ray Mellen pointed out that the Committee has to make the finding that the proposed device is a standard raised pavement marker. As a separate issue, Caltrans should come back to the Committee with the determination of whether raised pavement markers used for transverse delineation constitutes a proper use. Farhad Mansourian proposed to accept the 50 Hz device as standard. Jim Larsen and Gerry Meis, never having seen such a device, opposed the motion.

Jim Larsen asked if the City were willing to withdraw its request to experiment. Hamid Bahadori responded that if the devices were determined to be standard there is no need for a request. The proposal was only made on the assumption that the device is not standard. Wayne Tanda suggested that some members of the Committee examine the device to determine if it is a steady burn. The consensus of the Committee agreed.

Matt Schmitz expressed concern about the light intensity of the device. Retroreflectivity intensity can be no greater that the reflection of headlights. Because of this, retroreflectivity of raised pavement markers has never been an issue. He suggested that this issue should also be considered. Dick Folkers supported Committee members examining the device and suggested that it could be done within two weeks. Ray Mellen suggested the Caltrans Laboratory test the device in addition to the Committee members inspection.

99-9 LED ENHANCED PAVEMENT MARKERS (continued.)

Janna McKhann said because the devices are solar powered they don't have a great deal of intensity. There are only three LEDs which is enough light for guidance. Other versions have three lights for use in foggy conditions. Gerry Meis thought he could get test results from the Caltrans Lab in a reasonable amount of time, on both the issue of steady burn and degree of intensity if he could get a sample device. McKhann said she would send Meis a sample. She expressed concerned about the schedule of the University which is participating in the experiment, if the lab rejected the product.

Hamid Bahadori objected to delays resulting from a motion which waited for Caltrans Lab results, because of the need to give the University a timely answer. Farhad Mansourian responded that timeliness depended on the ability of the City to produce a sample 50 Hz device for the Lab to examine.

Gerry Meis did not want the Lab to make the determination of whether the device was a raised pavement marker. The Lab should determine if the device has a steady burn and if there is any problem with intensity. Meis noted that with other products there is a minimum intensity but no maximum intensity. The consensus of the Committee agreed noting that the subject of transverse pavement markers should be on the next agenda.

MOTION: By Farhad Mansourian, second by Dick Folkers that upon the review by the Caltrans Lab, if the device is found to meet the standard for raised pavement markers, the application for permission to experiment is cancelled. If the Caltrans Lab finds deficiencies, and the device does not meet the standard for raised pavement markers, the application to experiment is approved. Motion carried 7-0.

ACTION: Item completed.

99-10 TACTILE PEDESTRIAN INDICATORS

[See Item 99-3 for additional discussion.]

Wayne Tanda noted that the City of Los Angeles requested a recommendation to adopt the tactile device and the development of standards, or the right to experiment. He recommended approval to experiment and told the Committee that there is a proposal dated May 24, 1999 which was in the agenda for the previous meeting. There is no provision for how the City would evaluate the experiment. Tanda suggested that this be done by the active input of interested parties, which as a minimum, would include the California Council for the Blind (CCB). Ray Mellen concurred noting that the cover sheet of the proposal included the Southern California Association of Orientation and Mobility Specialists (SCAOMS).

John Fisher told the Committee that an additional location to the May proposal might be needed. Ray Mellen requested that an updated proposal be sent to Committee members. Sensing a Committee consensus, the Chairman did not wish to delay the City by waiting for the next meeting to vote on experimental approval.

Gene Lozano asked to have input into the design of the City's experiment. Without such input Lozano feels he may not get some of the information needed. John Fisher said that all parties getting together was agreeable to Mr. Gallagher. Farhad Mansourian thought that would be something the parties could work out among themselves, once the Committee authorized the experiment. Jim Larsen suggested that the two parties could try to reach agreement on the experiment and if that process doesn't work, the City could return to the Committee. John Fisher of the City of Los Angeles and Gene Lozano of the CCB agreed to work together. Gerry Meis asked that the cooperation between the groups be included, as a part of a report, submitted to the Committee at the next *(March)* meeting.

MOTION: By Wayne Tanda, second by Dick Folkers, to approve an experiment, subject to the concurrence of the CCB and the SCAOMS, of the tactile device by the City of Los Angeles. Motion carried 7-0.

ACTION: Item completed.

CTCDC MINUTES
November 19, 1999

99-12 SPEED STRIPING FOR SMART CROSSWALKS

Mel Araki told the Committee that fairly high speeds, high traffic volumes, and few paths, make it difficult for pedestrians to cross the Pacific Coast Highway (PCH) in marked crosswalks. The objective of this experiment is to slow vehicles as they approach the crosswalk, and to focus drivers attention toward pedestrians in the crosswalk. Speed striping, where transverse stripes are placed in the highway, is an illusionary device to fool the drivers into thinking they are going faster than they are. These markings also draw attention to the crosswalk. Araki realizes that a smoke and mirrors approach like this, does not have a lasting effect, but he is willing to take whatever benefits possible. Araki does not know of other attempts at speed striping.

Gerry Meis felt it was worth a try and said he would submit it to the FHWA process. Ray Mellen established that the project only consisted of painted stripes. Mel Araki was reluctant to use thermoplastic because of the slipperiness in a location where drivers are asked to brake. He prefers glass beads with paint.

Wayne Tanda said the City of San Jose tried this technique. They saw a reduction in speed but when the residents became accustom to it, which was a matter of a week, they totally ignored it. However, Tanda imagines quite a few of the 100, 000 motorists using the PCH would be non local. Mel Araki concurred noting that the PCH has a high visitor ratio.

Mel Araki told the Committee that three of the crosswalks were existing and one is proposed. John Wallo said the County of San Luis Obispo tried this twenty five years ago at key intersections and it did not work. Eventually they used Bott's Dots and that solved the problem of traffic running through the intersection because of the rumble strip effect. Wallo cautioned that one of the problems is keeping the paint looking fresh all the time. In addition, large volumes of traffic preclude motorists from noticing traffic markings on the pavement. Wallo pointed out that if successful, warrants would be needed, so that the process would not be misused.

99-12 SPEED STRIPING FOR SMART CROSSWALKS (continued.)

Mel Araki said he had not considered warrants, his criteria was finding a crosswalk at which pedestrians had a difficult time in crossing because motorists failed to stop. Motorists sometimes were going too fast and sometimes just ignored the pedestrians. Gerry Meis said that warrants would be resolved as a part of the experiment and suggested using transverse non-reflective raised pavement markers as a rumble strip. Araki noted that at most locations there were residential units close to the PCH that would object to the noise.

Mel Araki told the Committee that they would measure success by how long it took a pedestrian to cross the PCH, the number of motorist that stop for pedestrians, and the number of accidents, all on "before" and "after" installing the device. The main focus is on how many motorists stop for pedestrians wanting to cross the PCH. Ray Mellen would like to see more law enforcement attacking this problem. Jack Kletzman suggested Araki contact Bill Lane at Caltrans, Headquarters, because of his knowledge of durability and effectiveness in marking material.

Mel Araki said the existing crosswalks are laddered. There are conventional pavement markings and signs at these crosswalks. One location has a flashing amber light but pedestrians are still having trouble crossing. John Wallo wanted to know if the intersection met the warrant for a signal light. Araki responded that the intersection does not meet the warrants for a protected pedestrian crossing.

Wayne Tanda expects the residual effects to decrease and suggested that the experimental evaluation be done at two weeks and quarterly intervals thereafter. Ray Mellen suggested noting the amount of law enforcement "before" and "after". Tanda recommended that the evaluation include speed, traffic gaps and pedestrian delays, accidents, and crosswalk lighting evaluation.

99-12 SPEED STRIPING FOR SMART CROSSWALKS (continued.)

John Fisher thought that the percentage of motorists yielding to pedestrians should be measured. He also cautioned that with a striping pattern of about 400 feet in length, traveling at 40 mph which gives about 150 foot gap, motorists will not be able to see the full pattern. Ray Mellen concurred, suggesting data be taken during the commute period, week ends, and off peak times. He also requested data to identify when the largest problem occurs. Mel Araki responded that the largest pedestrian traffic occurs during week ends, but there is pedestrian traffic during the week.

Sameen Haddadeen told the Committee that the proposed striping pattern has the support of the various local agencies and the four local law enforcement jurisdictions. Haddadeen believes current counts may be understated because of the pedestrian's fear of high speed traffic. He feels there is a need to do more for the pedestrian. By establishing this marking pattern on the highway, at least the drivers attention will be brought to the existence of a crosswalk. Everyone in the community is familiar with PCH traffic issues and he expects them to be a good source of data.

MOTION: By Wayne Tanda, second by Merry Banks, to concur with the Caltrans experiment, subject to the Committees comments. Motion carried 7-0.

ACTION: Item completed.

99-13 ILLUMINATED PAVEMENT MARKERS ON MEDIANS

Gerry Meis explained that Mel Araki was proposing to put internally illuminated, steady burn, yellow, raised pavement markers on the top of median barrier where there is an accident problem. There is no existing standard for using raised retroreflective pavement markers on median barriers and therefore this is a new traffic control device.

Mel Araki told the Committee that there are a higher incidence of accidents in the Mclure Tunnel. There is no shoulder, the tunnel has a radius curvature of 725 feet, and as motorists enter the tunnel, the pass from a brightly lit Santa Monica beach area into the relative darkness of the tunnel. Drivers eyes do not adjust to the lower lever of lighting in the tunnel as rapidly as needed. This may be why there are an undue number of hit fixed object type accidents. The proposal is to use steady burn, internally illuminated raised pavement markers on top of the median barrier on 25 foot intervals. The markers would be powered inductively, so that if one marker were destroyed, the remaining markers would still function. It is hoped that if the median barrier were delineated there would be a reduction in accidents. Araki asked the Committee to approve the experiment.

Mel Araki said they tried the standard reflector that sits on edge, but they were knocked off the median barrier. Araki said they also considered a light tube, but any impact shuts down the device, and requires repair in a very constricted area. There are four lanes, two in each direction. Dick Folkers noted that, in Pasadena, on Route 210, the tunnel has inadequate lighting. If a driver enters the tunnel, wearing sun glasses it is difficult to see anything. He feels the illuminated raised pavement markers would be helpful. Folkers established that the majority of accidents occur when motorist hit the barrier when negotiating the turn within the tunnel. Ray Mellen complained that there doesn't seem to be a standard for tunnel illumination. He cited the tunnel under Foothill Blvd. on Route 210 has a massive amount of lighting in it, while the near-by tunnel in Pasadena has practically no lighting. Sameen Haddadeen responded that there were 73,000 vehicles per day using the tunnel and there are only two lanes in each direction. Maintenance waits for a significant number of bulbs to go out before instituting lane closures required to make the repair. Caltrans is under a strict obligation to maintain two open lanes in each direction. Haddadeen noted this was a stop gap measure to insure safety, pending other work in the tunnel and its environmental clearance.

99-13 ILLUMINATED PAVEMENT MARKERS ON MEDIANS (continued.)

Gerry Meis thought there were some outdated tunnels but renovating them is a matter of priority and available funding. He did not think there is a standard for tunnel lighting. Ray Mellen expressed his frustration at experimenting with this type of device when a lighting project would be more effective. Merry Banks suggested that, if this device were found to be successful in the tunnel, illuminating median barriers in other locations, such as in foggy areas, should be considered. Banks thinks of the issue as delineating median barriers, as opposed to a tunnel lighting issue.

John Wallo thought enhancing the lighting in the tunnel would be a solution. He suggested using a delineator instead of an illuminated raised pavement marker on top of the median barrier. Mel Araki responded that they were using an illuminated raised pavement marker as a delineator. Araki also said the device was powered by induction. There will be a wire on the barrier but the marker will not be in contact with the wire. Sameen Haddadeen said that if a marker gets knocked down, the remaining system will still be operational. The only maintenance needed would be to replace the marker. Lane closures will not be necessary.

Mike Harrison said his firm has a rain delineation project in Kansas sponsored by the FHWA. Data from this project should be available within four weeks. Harrison wanted to point out that some consideration should be given to any possible neurological effect caused by a flicker stimulus induced at eyeball height. This sometimes results in epileptic seizures or blacking out. Mel Araki said that the reason the markers were not put on the side of the barrier was that they were replacing existing markers. Araki wants to evaluate the glare effect of the markers before finalizing their position. If the markers can be rotated 45° and that is an optimum position, then a front and back device may be used to illuminate both directions. Otherwise two markers may be needed to face traffic. Wayne Tanda suggested random sampling of motorists.

MOTION: By Dick Folkers, second by Merry Banks, to concur with the Caltrans experiment. Motion carried 7-0.

ACTION: Item completed.

99-14 COMPRESSED NATURAL GAS SIGNS

Bill Fairbairn requested the Committee to recommend modification of the policy and symbol identified by G66-20 (NATURAL GAS), modification of the wording of the Caltrans Traffic Manual Section 4-04.15, and approval of the use of "trailblazer" signs with a newly designed G66-20.

After exhaustive research, Bill Fairbairn developed the proposed symbol signs G66-20A for compressed natural gas (CNG) and G66-20B for liquefied natural gas (LNG.) At the present time the G66-20 plate is hung below a G66-1which is a gas pump symbol sign. The problem is that motorists see the gas pump symbol sign, pull off the road and there is no gasoline, only natural gas. Fairbairn thinks the proposed signs make more sense. The CNG diamond and LNG diamond are recognized by the fifteen thousand natural gas vehicle drivers in California. There are one hundred and four natural gas stations. Most of these are operated by corporate yards and cities. Fairbairn noted that the current policy is that the service has to be with in $^{1}/_{2}$ mile of the freeway whereas similar signing uses 3 miles. He requested it be changed to 3 miles for consistency.

Dick Folkers said that a lot of governmental and private sector groups would like to see more alternate fuels available to the public. Gerry Meis said he would encourage Bill Fairbairn to submit this proposal to FHWA. Nothing has been done at the Federal level about adopting a symbol sign for natural gas. Should FHWA adopt a different symbol sign Caltrans and the Committee would have to re-visit this issue.

Merry Banks congratulated Bill Fairbairn and the California Natural Gas Vehicle Coalition for giving such an organized and clear presentation. She recommended other applicants use this as a model for their presentation. Wayne Tanda established that the natural gas refueling station may be within three miles of the freeway, and that it no longer is associated with the gasoline pump icon. He also established that the two new symbol signs were a CNG or LNG in a diamond. Tanda pointed out that the draft LNG policy has to be corrected to read "liquefied natural gas."

99-14 COMPRESSED NATURAL GAS SIGNS (continued.)

MOTION: By Dick Folkers, second by Merry Banks, to recommend changing from the NATURAL GAS plate to the CNG and LNG symbol signs and that these signs are to be independent of the gasoline pump icon. It is further recommended that the revised policy increases the allowable distance from the freeway to three miles, with appropriate trailblazers. Motion carried 7-0.

ACTION: Item completed.

99-15 ELECTRIC VEHICLE CHARGING SYMBOL SIGN

Gerry Meis asked that this item be withdrawn.

CTCDC MINUTES
November 19, 1999

99-16 CRENSHAW SAFETY BARRIERS

Ray Mellen recalled that this item was discussed at the last meeting but no action could be taken because it was not on the agenda. Dick Folkers explained that Mobile Oil Co. has a plant on Crenshaw Blvd., in the City of Torrence. They are under a Federal mandate to close the street when there are releases of what might be toxic material from the plant. Folkers said the Judge mandated that Mobile Oil use railroad type crossings guards for this purpose. At the last meeting the Committee felt that this was inappropriate in as much as there is no railroad.

Dick Folkers realizes that the standard requirements will not allow Mobil Oil to install railroad crossing guards. Nevertheless Mobile Oil remains under a judicial order to close the street. Railroad crossing guards, with their flashing lights, allow traffic to clear as they drop into position. With the gates down, traffic cannot enter that area until the air quality is at an acceptable level, at which time the gates are lifted.

Wayne Tanda noted that the correspondence to Dick Folkers said they were going to put in the railroad crossing guards anyway. Tanda suggested they do it. Ray Mellen said that Caltrans was using a similar device on the HOV lanes in San Diego. Mellen feels this is somewhat of a precedent. Jim Larsen suggested they use additional signs. Ray Mellen said he would review it when it was constructed or may try to contact Mobil Oil before installation.

MOTION: By Dick Folkers, second by Jim Larsen, to receive and file the correspondence. Motion carried 7-0.

ACTION: Item completed.

99-17 INDIAN RESERVATION SIGNS

Gerry Meis presented proposed changes to the Traffic Manual to allow signing to Indian reservations recognized by the Federal government. The directional signing from State routes and boundary signs will be negotiated by local Caltrans District offices.

MOTION: By Wayne Tanda, second by Farhad Mansourian, to recommend the proposed changes to the Traffic Manual and the proposed signs. Motion carried 7-0.

ACTION: Item completed.

CTCDC MINUTES
November 19, 1999

99-18 GROUND MOUNTED LED LIGHTS ON STOP BARS

Ray Mellen explained to the Committee that after the agenda was sent out, an additional item was received, concerning the City of Anaheim. Members were notified by a letter from the Secretary dated November 3, 1999.

John Lower told the Committee that their problem is in the Disneyland resort area where a new theme park is under construction. There is an accident problem at a particular intersection, caused by motorists not focused on the traffic signal and not stopping at the STOP bar. This intersection has a nice view of a roller coaster under construction. This proposal is an attempt to improve the visibility of the signal and the STOP bar at the intersection.

Pat Gibson said the intersection is along Disneyland Drive and connects portions of the parking lot with the theme park. Visitors come into the parking lot, park their car, and then get transported to the main entrance of the theme park and back to their cars by trams. There are about 25,000 people a day using the trams. There are also cars driving through the intersection. Gibson thinks there is a safety problem related to signal visibility. The intersection itself is a little strange which adds to the confusion.

There is a four lane divided roadway in the North-South direction with no turns allowed. It has a raised median. In the East-West direction there are five lanes. The northerly two lanes handle the tram traffic, the southerly three lanes handle the vehicle traffic. Because the visitor load enters in the morning and leaves at night, they have reversible operations. They propose to emphasize the STOP bar on the Southbound approach to the intersection.

Pat Gibson said they have had seven accidents in fourteen months - five southbound, two northbound. Six of the seven have been angle collisions. Gibson feels there is a problem in both directions, but predominately in the southbound direction. They think that drivers see cars coming across in the South half of the intersection and cheat in the north half of the intersection, right into a crossing tram. Two of the southbound accidents involved trams. One tram carries 125 people and the other has a capacity for 300 people. Tram accidents pose a serious financial concern. In the East-West direction, the south half of the intersection is for automobile lanes the north half is for trams. Trams have a flashing yellow light on the front and back.

99-18 GROUND MOUNTED LED LIGHTS ON STOP BARS (continued.)

In order to improve signal visibility Pat Gibson said they removed some of the vegetation. There are gates on the East-West roadway. Gates won't work in the North-South direction because it would back northbound traffic up into Katella Avenue. Katella Avenue is a six lane facility which handles 40,000 vehicles a day. Gibson said they tried adjusting the signal phasing, warning signs with flashers, and they plan to install an overhead TRAM AHEAD sign with flashers, in both directions. There are rumble strip dots on the pavement and Disney has posted personnel on both sides of the intersection. All this is during construction and he fears it may get worse with a newly completed roller coaster.

Pat Gibson told the Committee the proposal is to add LED lights to the northbound and southbound STOP bars. They looked at four different combinations - flashing yellow LEDs during the amber signal phase, a solid red LEDs during the red signal phase, and no light when the signal phase is green; flashing and solid yellow; flashing yellow alone; and flashing and solid white to correspond to the pavement marking of the STOP bar.

Essentially the accidents are happening in the afternoon. The problem with white LEDs is the lack of visibility during daylight hours. Yellow and red LEDs may not work because solid red is interpreted as "wrong way direction." Flashing yellow with nothing during the red signal, phase doesn't keep the driver's from creeping over the STOP bar. Gibson wants some indication active during the red signal phase. He concluded that the flashing and solid yellow were the best alternative but remains interested in the flashing yellow and solid red. That is more in conformance with what the signal is doing. The pavement LEDs will be connected with the signal so they operate simultaneously with the yellow and red signal phases.

Pat Gibson propose a two year experiment with the following evaluation process. The STOP bar will be videotaped "before" and "after" during the two traditional commute peak hours and the two peak traffic hours for the intersection. The peaks for the intersection are late morning and late evening when the parking lot fills and empties. Gibson said they will take 40 hours of video tape of the "before" condition and 16 hours of video tape each quarter of the "after" condition.

99-18 GROUND MOUNTED LED LIGHTS ON STOP BARS (continued.)

The goal is to get motorists to stop at the STOP bar. Pat Gibson wants to measure how many times that first vehicle come to a complete stop, behind the STOP bar, and not cheat. He also wants to measure, with an LED that is lit during the red signal phase, how many vehicles stay behind the STOP bar and not cheat. Although there is an accident history available for comparison, Gibson believes this is a better measure of the effectiveness of the proposal.

Wayne Tanda said the proposal was very well thought out and appreciate the other measures being taken. Pat Gibson noted that the only thing new is the addition of LEDs. The intersection has existed for fourteen months. Dick Folkers established that Anaheim does not have the enforcement program where violators are photographed. Folkers suggested this program in addition to the $271 fine sign. Ray Mellen thought that the problem was encroachment into the intersection. Two accidents had been caused by motorists running the red light. Pat Gibson responded that the intersection is already busy, prohibiting all turns, and motorists are not seeing the TRAM AHEAD sign. He did not think another sign would help.

Pat Gibson reiterated their preference for the flashing yellow and red to match the traffic signal. The negative remains that such a device has been established to mean wrong way, but there is no way to turn between the barrier curbs. Gerry Meis expressed concern about motorists getting confused with crosswalk lights, which are flashing yellow. Meis preferred the flashing yellow and red system. Jim Larsen reminded everyone that the problem was to keep the motorist from creeping past the STOP bar. Larsen believes the motorist would have to be a long way back in order to keep the LED in his view and he doesn’t see this happening.

Pat Gibson said the LEDs would be in six foot intervals across the STOP bar so that the driver would always have a view of the light. Ray Mellen was concerned about the maintenance of existing painted STOP bars. Mike Harrison said that it was his experience that motorists are now stopping well ahead of the STOP bar or crosswalk in order to see if the LEDs are flashing. He favors the colors matching the traffic signal phase. Farhad Mansourian established that the two year experimental period will include conditions under which the roller coaster ride is operational. The ride is scheduled to be operational by January 2001.

99-18 GROUND MOUNTED LED LIGHTS ON STOP BARS (continued.)

Pat Gibson estimates implementation within 60 days. His goal is to have the something in place before the Xmas peak and expects to have some data before the March meeting of the CTCDC. Ray Mellen expressed serious concern about having red pavement markers. He requested that, if there were any indication that this is a failed attempt, the experiment be immediately modified.

MOTION: By Dick Folkers, second by Wayne Tanda, to approve the request to experiment using the flashing LED traffic signal matching color scheme.
Motion carried 6-1.

ACTION: Item completed.

CALTRANS ACTIONS

Item 90-7 BICYCLE SIGNAL HEADS

Caltrans reviewing CTCDC recommended warrants.

Item 92-18 GOLF CART SYMBOL SIGN

Caltrans to make the sign specification upon receiving the FHWA approved symbol sign.

Item 93-18 CROSSWALKS, SEQUENTIAL LIGHTING

Caltrans in the process of testing.

Item 94-10 PEDESTRIAN SIGNAL HEAD

Item under experimentation.

Item 96-3 ILLUMINATED LEFT TURN YIELD SIGNS

Caltrans developing standard plan.

Item 96-7 SPEED LIMIT SIGNING

Caltrans is reviewing the Committee's recommendation.

Item 99-1 GAPS FOR PEDESTRIAN CROSSINGS

Item to be resolved by Caltrans and then brought back for discussion.

Item 99-3 AUDIBLE PEDESTRIAN SIGNAL POLICY

Caltrans reviewing CTCDC recommendation for changes in the Traffic Manual.

Item 99-9 LED ENHANCED PAVEMENT MARKERS

Caltrans views the internally illuminated pavement marker as a normal roadway pavement marker unless the laboratory uncovers data to the contrary.

Item 99-10 TACTILE PEDESTRIAN INDICATIORS

Item under experimentation.

Item 99-11 MUTCD ADOPTION BY CALTRANS

Caltrans awaiting publication of the MUTCD.

CALTRANS ACTIONS

Item 99-12 SPEED STRIPING FOR SMART CROSSWALKS

Item under experimentation.

Item 99-13 ILLUMINATED PAVEMENT MARKERS ON MEDIANS

Item under experimentation.

Item 99-14 COMPRESSD NATURAL GAS SIGNS

Caltrans to develop sign specifications.

Item 99-15 ELECTRIC VEHICLE CHARGING SYMBOL SIGN

Item withdrawn.

Item 99-16 CRENSHAW SAFETY BARRIERS

No action required.

Item 99-17 INDIAN RESERVATION SIGNS

Caltrans in the process of changing the Traffic Manual and developing the sign specifications.

Item 99-18 GROUND MOUNTED LED LIGHTS ON STOP BARS

Item under experimentation.